

REMARKS

After entry of this amendment, claims 3-4, 6-12, 14-18, 21-25, 27, and 30-38 are pending. In the present Office Action, claims 1-23 were rejected under 35 U.S.C. § 101. Claims 1-2, 7, 13-16, 24-25, and 30-31 were rejected under 35 U.S.C. § 102(e) as being anticipated by Mason, Jr. et al., U.S. Patent Application Publication No. 2003/0142561 ("Mason"). Claims 3-4, 6, 17-19, 23, 26-27, and 33 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mason in view of Traversat et al., U.S. Patent No. 6,854,115 ("Traversat"). Claims 8-9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mason in view of Chauvel et al., U.S. Patent No. 6,754,781 ("Chauvel"). Claims 35-38 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tross et al, U.S. Patent Application Publication No. 2005/0071549 ("Tross") in view of Mason. Applicants respectfully traverse these rejections and request reconsideration.

Section 101 Rejection

Claims 1-23 were rejected under 35 U.S.C. § 101 for allegedly being directed to non-statutory subject matter. Particularly, the Office Action alleges that the computer accessible medium includes signals, citing the specification, page 24, lines 7-13. (See Office Action, page 2, item 1). Applicants continue to disagree. However, Applicants have adopted the Examiner's suggestion to amend the claims to recite a computer accessible storage medium. Applicants respectfully submit that the amendment addresses the rejection.

Allowable Claims 3-4, 6, 10-12, 17-18, 21-25, and 27

Claim 3 has been amended to recite the features of claim 5 (which was not rejected on art in the present Office Action). Accordingly, claim 3 is in condition for allowance. Claims 4 and 6, dependent from claim 3, are similarly in condition for allowance.

Claim 10 was not rejected on art in the present Office Action. Accordingly, claim 10 is in condition for allowance. Claims 11-12, dependent from claim 10, are similarly in condition for allowance.

Claim 17 has been amended to include the features of claim 20. Claim 20 was not rejected on art in the present Office Action. Accordingly, claim 17 is in condition for allowance. Claims 18 and 21-23, dependent from claim 17, are similarly in condition for allowance.

Claim 24 has been amended to include the features of claims 26 and 28. Claim 28 was indicated as allowable in the present Office Action. Accordingly, claim 24 is in condition for allowance. Claims 25 and 27, dependent from claim 24, are similarly in condition for allowance.

Claims 7-9 and 14-16

Applicants respectfully submit that each of claims 7-9 and 14-16 recite combinations of features not taught or suggested in the cited art. For example, claim 7 recites a combination of features including: "receive one or more additional blocks from the image repository system, wherein the one or more additional blocks are received independent of read requests generated in the computer system and received by the device driver; store the one or more additional blocks in the first storage; and update the map to indicate that the one or more additional blocks are stored in the first storage".

With regard to claim 13, the Office Action asserted that the above highlighted features are taught in Mason, asserting that the boot optimizer executed by the CPU 32 in the cache controller 32 runs independent of the read requests. Applicants respectfully disagree. The boot optimizer only caches data read from the disks in response to host requests. For example, Mason teaches "A boot process running on the CPU 32, in an initial mode, determines that a system boot is in process and begins recording which data blocks or tracks are accessed from the disk 12. The accessed data is then not only provided to the host 10, but also then preserved in the non-volatile cache memory 38 for use during subsequent boot processing." (Mason, paragraph 34) Thus, only data requested by the host 10 is cached. Furthermore, Mason teaches "Because the boot process simply learns the nature of which boot data is needed by detecting actual requests

for data from the host to the mass storage device during the boot process, the nature of the data requested is irrelevant to the invention. Therefore, the invention may be implemented in a way that is independent of the host operating system, and may be used to rapidly access both operating system data and application program data during a power on or other boot sequence." (Mason, paragraph 52). Thus, it is the heart of Mason's invention to only cache data in response to actual requests. Mason cannot possibly teach or suggest the above highlighted features of claim 7.

For at least the above stated reasons, Applicants submit that claim 7 is patentable over the cited art. Claims 8-9 and 17-16, being dependent from claim 7, are similarly patentable over the cited art for at least the above stated reasons as well. Each of claims 8-9 and 14-16 recite additional combinations of features not taught or suggested in the cited art.

Claims 30-34

Applicants respectfully submit that each of claims 30-34 recite combinations of features not taught or suggested in the cited art. For example, claim 30 recites a combination of features including: "the image repository system is configured to respond to the remote boot request with a program which, when executed by the computer system, initiates execution of the set of software resources prior to at least some blocks in the image being copied to the computer system, and wherein the computer system includes a first storage that is to store the image, and wherein the set of software resources includes a device driver for the first storage which, when executed in response to a read request generated responsive to executing the set of software resources, is configured to check the first storage for a first block identified by the read request, and wherein the device driver is configured to supply the first block from the first storage if the first block is stored in the first storage".

The Office Action alleges that the computer system recited in claim 30 is the combination of Mason's host 10 and cache controller 20, and that the image repository system is Mason's disk devices 12. Furthermore, the Office Action asserts that the

remote boot request is the request generated by the cache controller 20 for boot data that is not found in the cache 38. The Office Action then asserts that the program returned by the image repository system as recited above is taught as the program executed by the CPU 32 in the cache controller 20, to perform the advanced caching functions and management functions as described, e.g., in paragraph 32. However, there is no teaching in Mason that the program executed by the CPU 32 is stored on the disks 12. Instead, Mason teaches that the cache controller 20 is transparent to both the host 10 and the disk 12. (See paragraph 30). For the cache controller 20 to be transparent, the code executed by its CPU 32 could not be stored on the disk 12. The code would be visible to the host 10, and would also be read by the cache controller 20 prior to the host 10 booting, which would make it visible to the disks 12.

Furthermore, as noted above, the Office Action asserts that the remote boot request is the request for data by the cache controller 20 when the boot data is not found in the cache 38. Since the cache controller 20 detects such non-cached boot data by executing the code in the cache controller 20 on the CPU 32, the program returned by the disks 12 in response to request from the cache controller 20 cannot be the code executed by the CPU 32. Rather, the code executed by the CPU 32 must be stored in the cache controller 20.

Additionally, the Office Action asserts that the set of software resources recited in claim 30 is the operating system and application data stored on the disk 12 in Mason. However, since the cache controller 20 operates transparently to both the host 10 and the disks 12, as noted above, the operating system and application data (executed by the host 10), cannot possibly include "a device driver for the first storage which, when executed in response to a read request generated responsive to executing the set of software resources, is configured to check the first storage for a first block identified by the read request, and wherein the device driver is configured to supply the first block from the first storage if the first block is stored in the first storage". For the device driver to check for the block in the cache 38, the cache controller 20 would have to be non-transparent.

For at least the above stated reasons, Applicants submit that claim 30 is patentable over the cited art. Claims 31-34, being dependent from claim 30, are similarly patentable over the cited art for at least the above stated reasons as well. Each of claims 31-34 recite additional combinations of features not taught or suggested in the cited art.

Claims 35-38

Applicants respectfully submit that each of claims 35-38 recite combinations of features not taught or suggested in the cited art. For example, claim 35 recites a combination of features including: "an image repository computer system configured to store an image of a set of software resources; and a computer system coupled to communicate with the image repository computer system, wherein the computer system is configured to execute the set of software resources, and wherein the computer system is configured to track which blocks in a first storage from which the computer system is configured to boot and which correspond to the image are updated with respect to the image stored on the image repository computer system, the updates generated by the computer system during execution of the set of software resources".

The Office Action asserts that Tross teaches the image repository system as storage node B in Fig. 1 (element 24) and the computer system as storage node A in Fig. 1 (element 22). Applicants respectfully submit that nothing in Tross teaches or suggests that the storage node A is "configured to execute the set of software resources" wherein the storage node B is "configured to store an image of the software resources".

Tross teaches the following with regard to storage nodes A and B: "Each of subsystems 22 and 24 comprises a control unit (CU) 30, typically comprising one or more microprocessors, with a cache 32 and non-volatile storage media 34. Typically, cache 32 comprises volatile random-access memory (RAM), while storage media 34 comprise a magnetic disk or disk array. Alternatively, other types of volatile and non-volatile media may be used to carry out the cache and storage functions of subsystems 22 and 24. Control units 30 typically carry out the operations described herein under the control of software, which may be downloaded to subsystems 22 and 24 in electronic

form, over a network, for example, or may be provided, alternatively or additionally, on tangible media, such as CD-ROM." (Tross, paragraph 38). Thus, the software executed by the storage nodes 22 and 24 is downloaded to the storage nodes 22 and 24 or is provided on CD-ROM. Particularly, the software is not stored on the non-volatile storage media 34 in the storage nodes 22 and 24. Rather, the data stored on the non-volatile storage media 34 is read and written by the host computer 26: "System 20 comprises storage subsystems 22 and 24, which are labeled 'storage node A' and storage node B' for convenience. In the description that follows, it is assumed that node A is configured as the primary storage subsystem, while node B is configured as the secondary storage subsystem for purposes of data mirroring. Thus, to write and read data to and from system 20, a host computer 26 (referred to hereinafter simply as a "host") communicates over a communication link 28 with subsystem 22. Typically, link 28 is part of a computer network, such as a storage area network (SAN). Alternatively, host 26 may communicate with subsystem 22 over substantially any suitable type of serial or parallel communication link. Although for the sake of simplicity, only a single host is shown in FIG. 1, system 20 typically serves multiple hosts. Typically, in normal operation, hosts may write data only to primary storage subsystem 22, but may read data from either subsystem 22 or 24" (Tross, paragraph 36).

Thus, data stored by the storage nodes A and B are used by the host or hosts, not by the storage nodes themselves. For at least this reason, the storage node A cannot be the recited computer system, because it is not configured to execute the software resources stored in an image on storage node B.

Furthermore, the Office Action alleges that Tross teaches "the computer system is configured to track which blocks in a first storage ... and which correspond to the image are updated with respect to the image stored on the image repository computer system, the updates generated by the computer system during execution of the set of software resources" at paragraph 42. Applicants respectfully disagree. As noted above, the storage node A does not execute the set of software resources stored in the image on the storage node B. Therefore, the tracking described in paragraph 42 has nothing to do with

updates generated by the storage node A during execution of any software.

Additionally, the Office Action alleges that Mason teaches a set of software resources and a storage device from which a computer is configured to boot. However, the combination of Tross and Mason still would not teach or suggest the features of claim 35. Rather, the combination would provide a storage device from which the storage node A is configured to boot. However, there would still be no teaching the storage node A executing software resources for which an image is stored on the storage node B.

For at least the above stated reasons, Applicants submit that claim 35 is patentable over the cited art. Claims 36-38, being dependent from claim 35, are similarly patentable over the cited art for at least the above stated reasons as well. Each of claims 36-38 recite additional combinations of features not taught or suggested in the cited art.

CONCLUSION

Applicants submit that the application is in condition for allowance, and an early notice to that effect is requested.

If any extensions of time (under 37 C.F.R. § 1.136) are necessary to prevent the above referenced application(s) from becoming abandoned, Applicant(s) hereby petition for such extensions. If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5760-16400/LJM.

Respectfully submitted,

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